



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Cytology of *Neottia Nidus-avis*.—A paper by MODILEVSKI,¹⁷ dated 1918, has just reached this country from Kiev, Russia. The paper is in Russian, but has a rather complete summary and an explanation of figures in English. The cytological part deals principally with the behavior of the chromatin during the two reduction divisions in oogenesis. Particular attention was given to the character of the spirem thread, and the conclusion was reached that no true double structure is present either before synapsis, during synapsis, or immediately after, although in rare cases a parallel orientation could be seen in the late spirem stage. Before the diakinesis stage is reached, a double character is easily observed, and eighteen bivalent chromosomes are formed, some of which are larger than others. One of the bivalents is much longer than the rest, and is conspicuous during the subsequent stages of division. MODILEVSKI believes that in structure the chromosomes are masses of threads, and that there is no vacuolization, like that described by GREGOIRE and many others. Besides the long chromosome, there are three others which are morphologically different from the remaining fourteen chromosomes; however, he does not seem to think that this situation has any serious value for theoretical considerations. Reduction was also studied in the pollen mother cell.

Some attention is given to the nucleolus, which he thinks consists of two distinct morphological and chemical constituents. One element is the permanent nucleolus, which stains with iron-haematoxylin, and is identical with the nucleolus of somatic nuclei. The second has the shape of a sickle and rests upon the other like a cap. It stains like chromatin. These two kinds of nucleoli always appear during late synapsis in *Neottia Nidus-avis*. During the two reduction divisions of the megaspore mother cell no walls are formed, and all four megaspores take part in the development of the embryo sac. The two antipodal nuclei do not divide again, but the other two enlarge and divide, so that there are four nuclei at the micropylar end of the sac. They develop a typical egg apparatus and a polar nucleus. One of the male nuclei fuses with the egg nucleus and the other with the micropylar polar nucleus. As the young embryo develops, four free nuclei are found in the embryo sac, one of them a synergid nucleus, the two antipodal megaspore nuclei, and the nucleus formed by the fusion of a sperm with the micropylar polar nucleus. There is no free nuclear division or any formation of endosperm.—C. J. CHAMBERLAIN.

Sporidial infection in *Puccinia graminis*.—A recent contribution to the series of studies in the physiology of parasitism emanating from the Imperial College of Science and Technology (London) is by WATERHOUSE,¹⁸ describing

¹⁷ MODILEVSKI, J., Cytological and embryological studies on *Neottia Nidus-avis*. pp. 55. pls. 1, 2. 1918.

¹⁸ WATERHOUSE, W. L., Studies in the physiology of parasitism. VII. Infection of *Berberis vulgaris* by sporidia of *Puccinia graminis*. Ann. Botany 35:557-564. figs. 19. 1921.

host penetration by the sporidial germ tube of the cereal stem rust fungus. Although ERIKSSON studied sporidial infection in the mallow rust, concluding that penetration is directly through the epidermal cell wall and never through stomata, no careful study of the mechanism of entry of the sporidial germ tube has previously been made. In the present account penetration is shown to result from mechanical action alone, the structures concerned in the process being a mucilaginous investment of the germ tube and a fine style-like infection hypha, originating either from the germ tube or the sporidium directly. The entry of the parasite at first causes no visible alteration of the host cell contents. This manner of parasitic entry, that is, in the absence of visible chemical softening processes of the cuticle, is similar to that previously reported for the infection hypha of *Botrytis* and *Colletotrichum*, and for the zoospore of *Synchytrium* (CURTIS). A new interest is thereby given to studies of disease resistant or disease escaping plants directed toward the mechanical properties of the cuticle and cell wall. Evidence that resistance to infection of potato by *Pythium debaryanum* is of this type has already been presented (HAWKINS and HARVEY); similarly for resistance in the tomato to infection by *Macrosporium tomato* (SANDO and ROSENBAUM).

The question is pertinent whether the resistance or immunity shown by different species of *Berberis* to infection by *Puccinia graminis* is due to mechanical exclusion of the germ tube by a heavy cuticle. There is some evidence that this may be true for the evergreen thick leaved species of *Berberis* generally referred to *Mahonia* or *Odostemon*. Greenhouse inoculations with several forms of *Puccinia graminis* have resulted in infection of very young leaves of *Berberis trifoliolata*, *B. Fremontii*, and the tall form of *B. Aquifolium*=*Odostemon Nutkanus* (DC) Rydb., although on the last named host only abortive pycnia and no aecia developed. Some other factor appears to be concerned in the immunity of *Berberis Thunbergii* to cereal stem rust, since this plant has soft, thin leaves which lack a well developed cuticle.—FREEMAN WEISS.

Further studies on *Tmesipteris*.—The life history of the Psilotales is becoming as well known as that of more accessible lycopods through the continued researches of HOLLOWAY,¹⁹ who has published a second paper on the prothallus of *Tmesipteris*, containing additional observations made possible by the finding of more than 200 additional prothallia. *Tmesipteris* and *Psilotum* both have sporelings which resemble their gametophytes. This similarity is not considered by HOLLOWAY as being sufficient evidence for the primitiveness of the Psilotaceae; but he points out that this close correspondence is not found in the life history of other modern Pteridophytes. This resemblance between the two generations, the superficial position of the sex organs, the persistent single apical cell of the prothallus, the dichotomous

¹⁹ HOLLOWAY, J. E., Further studies on the prothallus, embryo, and young sporophyte of *Tmesipteris*. Trans. New Zealand Inst. 53:386-422. 1921.